Dealing with Overcapacity: Individual Transferable Quotas

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What is meant by overcapacity?

It will be hard to “deal” with it or even discuss it intelligently, if we do not have a consistent and commonly accepted definition.

The US is participating in FAO's International Plan of Action on the Management of Fishing Capacity and has adopted their definitions of Capacity and Overcapacity.

See the US National Plan of Action for the Management of Fishing Capacity which was distributed to participants.

If you do not remember anything else from this discussion, please remember that:

Capacity is different than fleet size.

Capacity is how much fish we can catch and even with a constant fleet, it varies with stock size, market conditions, and the state of technology.

In order to consider the issue of overcapacity, it is useful to use the following concepts.

Harvest Capacity

Target Harvest Level

Regulated Harvest Capacity

We have overcapacity if, ***for a given resource condition***, the unregulated fleet will normally catch more than it "should" catch.

Harvest capacity is, for a given resource condition, the amount of fish that can be produced over a period of time (e.g. a year) by a vessel or a fleet if fully utilized, that is ***if effort and catch are not constrained by restrictive management measures.***

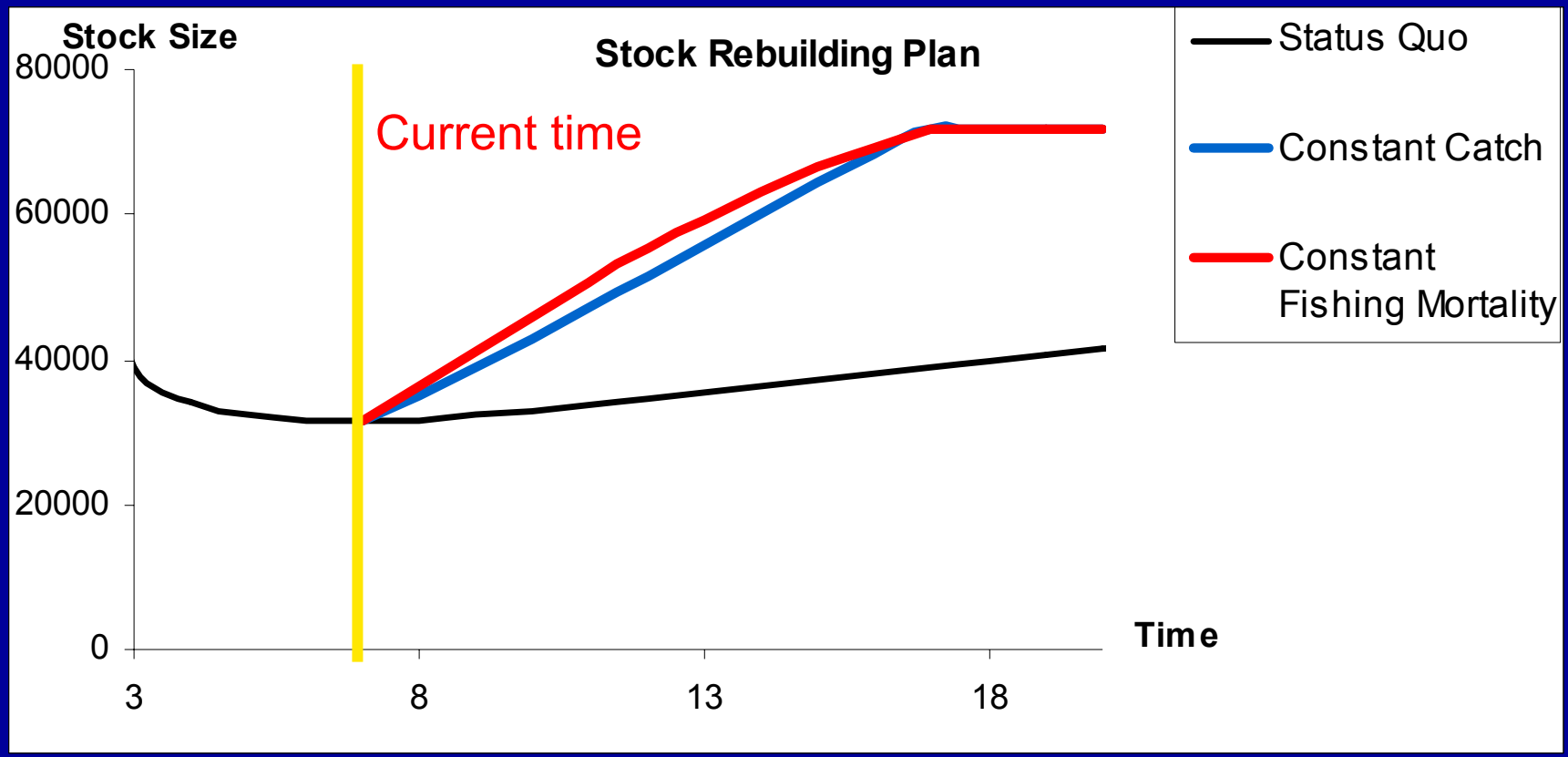
(Full utilization means normal, but unrestricted, use rather than maximum use.)

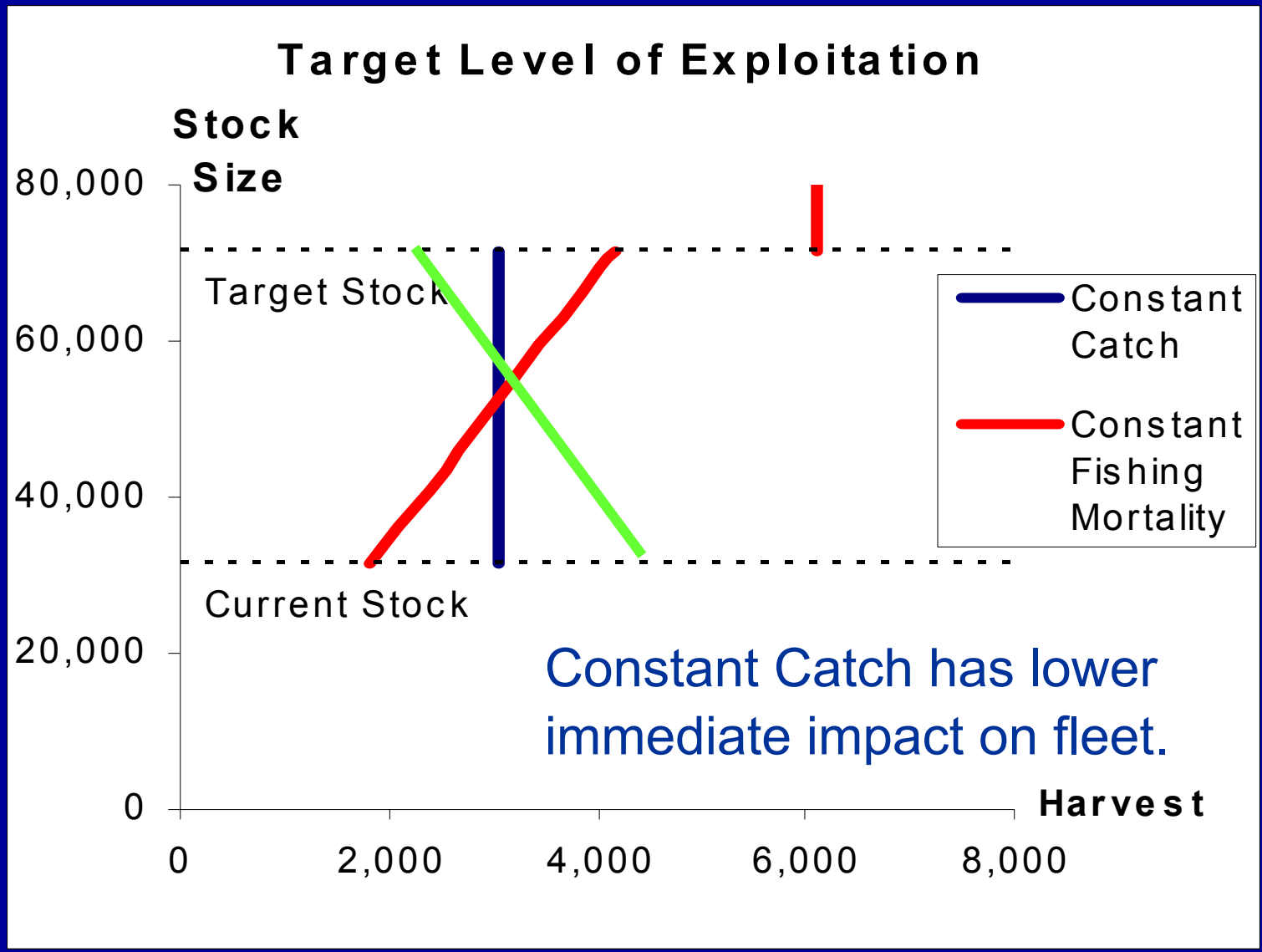
Consider this in terms of a graph.

As stock size increases, the same fleet fishing the same way will, up to a point, generally catch more. In addition, at higher stock sizes, vessels may have incentives to fish harder because of the higher potential returns.

For discussion purposes, the target harvest level is, for a given resource condition, the amount of fish that can be sustainably produced or the amount that must be produced if a stated stock rebuilding program is to be achieved.

How much we should catch is determined by the stock rebuilding plans mandated by the MS Act.




Target Level of Exploitation
Stock Size
80,000
60,000
40,000
20,000
0
Target Stock
Current Stock
Constant Catch
Constant Fishing Mortality
Constant Catch has lower immediate impact on fleet.
Harvest
0
2,000
4,000
6,000
8,000

The determination of the target stock size and the path to achieving it are social questions with biological overtones (or perhaps biological questions with social overtones).

Overcapacity in a fishery describes a situation where, for a given stock size, the capacity of the current fleet is higher than that required to achieve the ***target harvest level.***

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Capacity is a technical issue.

It is what will normally be caught with no regulation.

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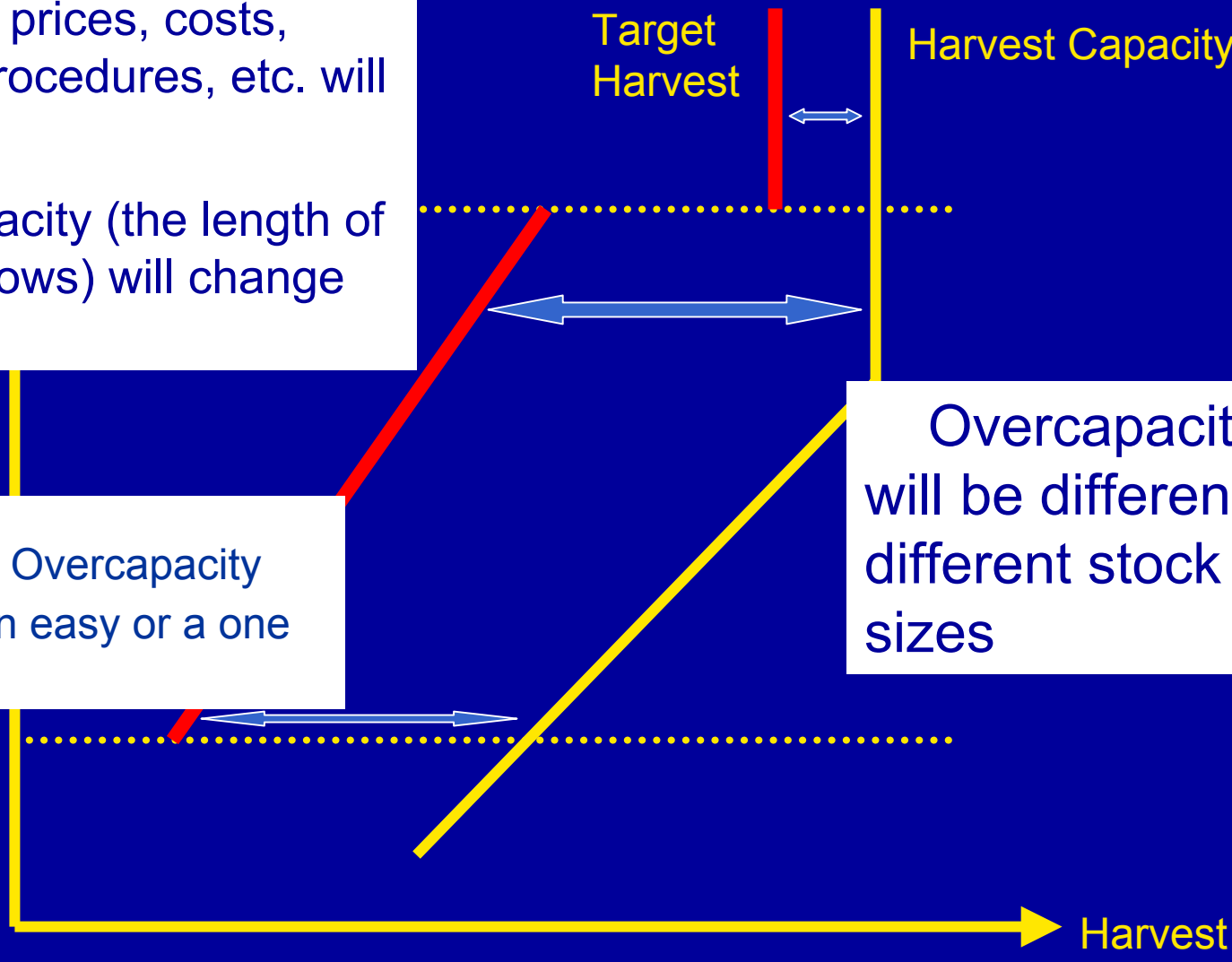
Target harvest level is a biological/social issue.

It is what “should” be caught.

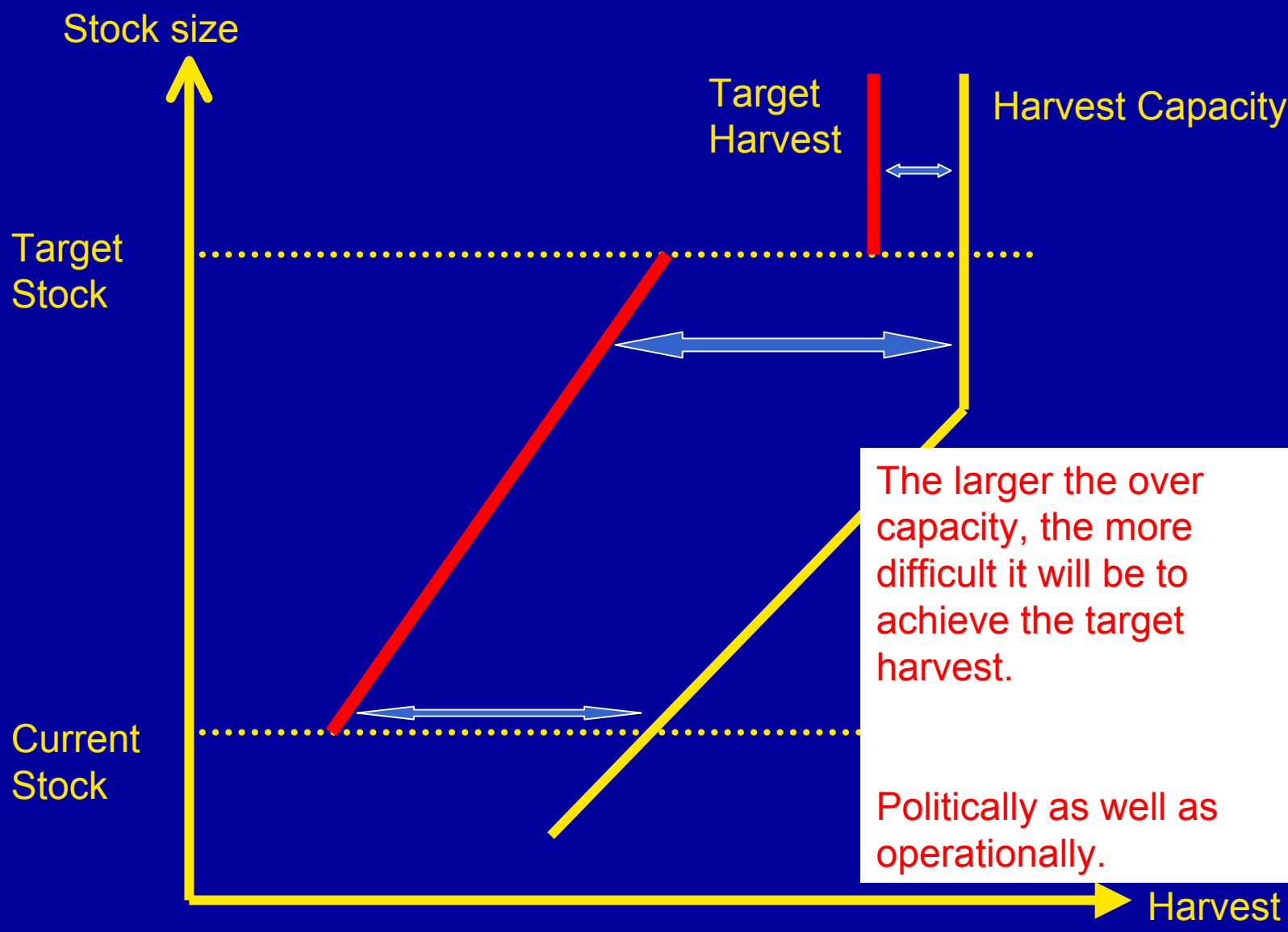
Overtime, harvest capacity will change because fleet size, technology, prices, costs, operating procedures, etc. will change..

So overcapacity (the length of the blue arrows) will change over time..



Determining Overcapacity will not be an easy or a one time job.

Overcapacity will be different for different stock sizes

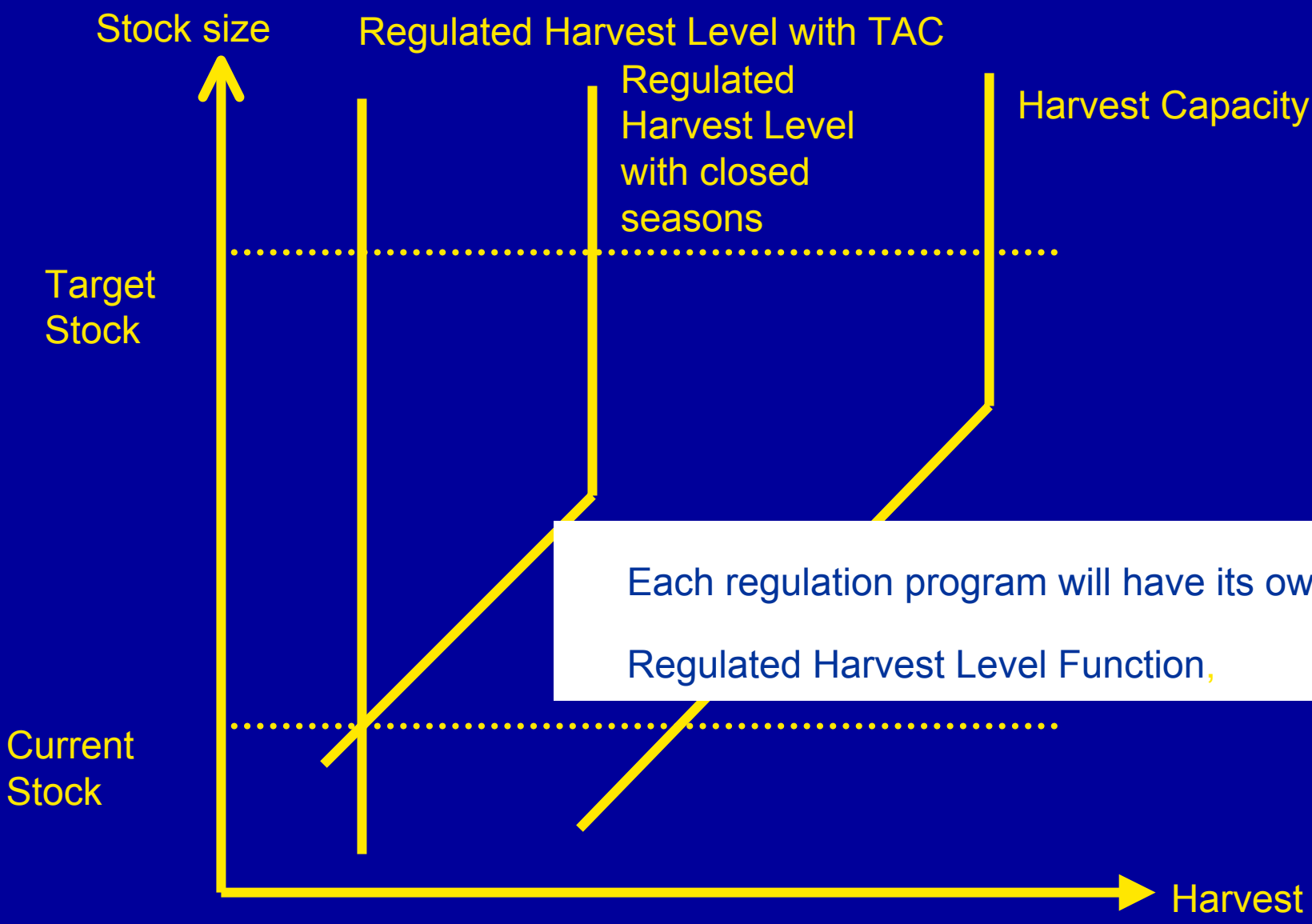

Stock size
Target Harvest
Harvest Capacity
Target Stock
Current Stock
Harvest
The larger the over capacity, the more difficult it will be to achieve the target harvest.
Politically as well as operationally.

To really understand the problem, I believe we need one more concept that is ***sometimes*** omitted from these discussions.

Regulated Harvest Level

Regulated Harvest Level is, for a given resource condition, the amount of fish that ***will*** be produced over a period of time (e.g. a year) by a vessel or a fleet if fully utilized, *while effort and/or catch are subject to specified restrictions, controls, or programs.*

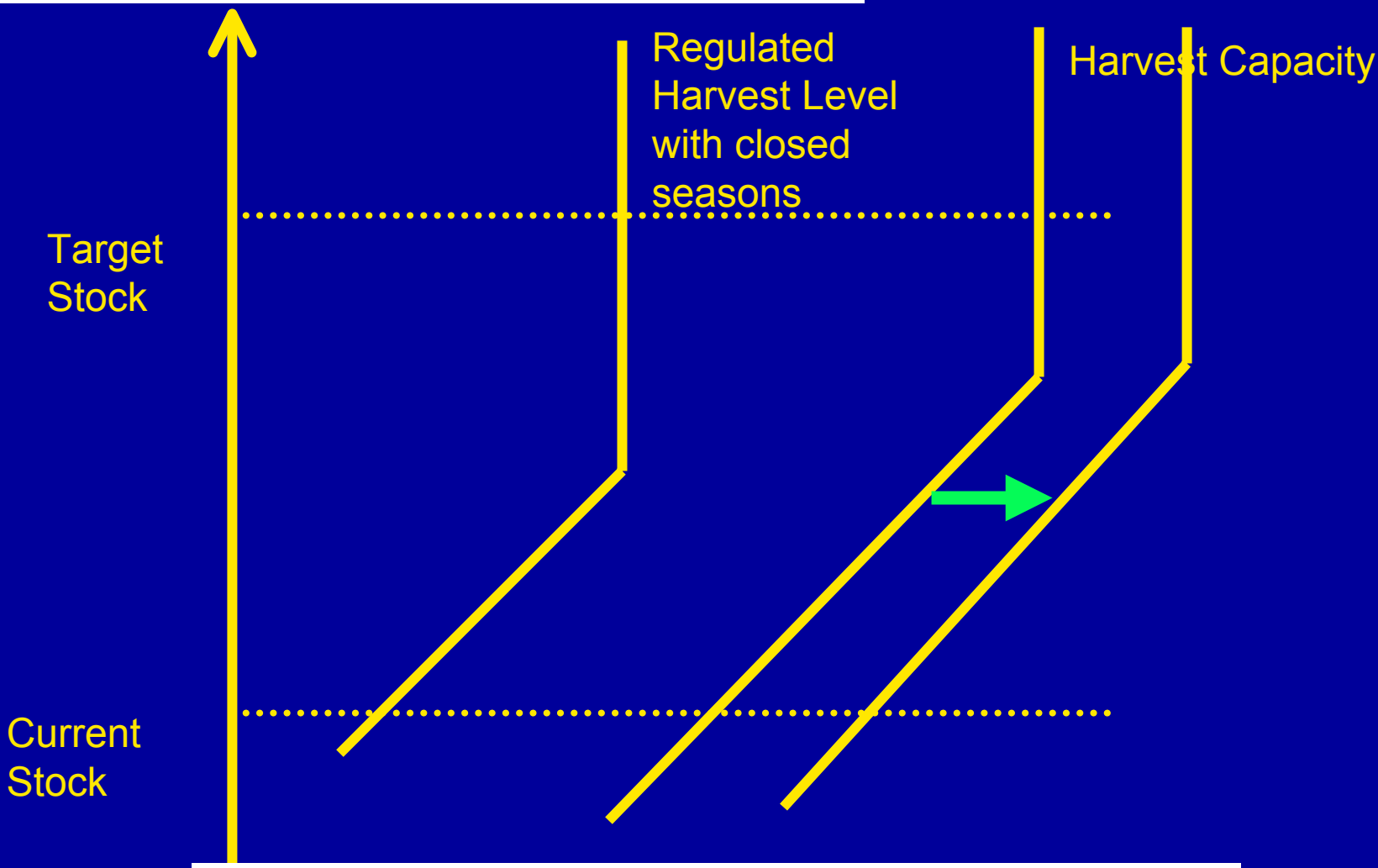
(Full utilization means normal use rather than maximum use.)



Each regulation program will have its own

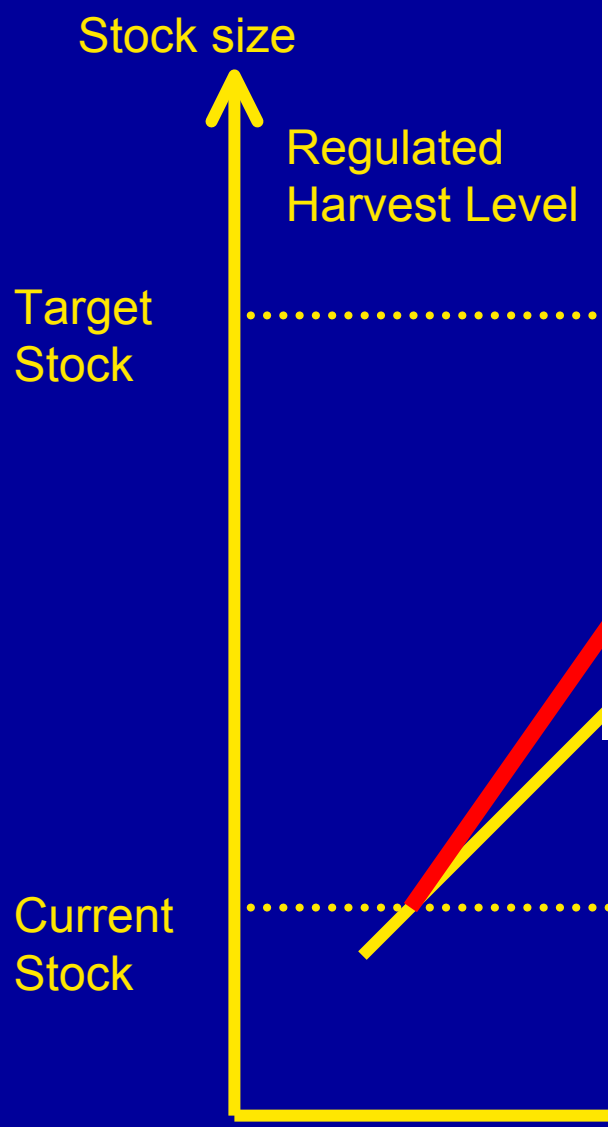
Regulated Harvest Level Function,

The type of regulation will affect how Harvest Capacity will change over time!!!



A closed season can provide incentives to increase catch per day which will increase harvest capacity.

Look at annual management in terms of these graphs.



Issues of Concern are:

Did we get the right catch this year?

What incentives were given to change harvest capacity and the regulated harvest level ?

What management changes will be required in the future?

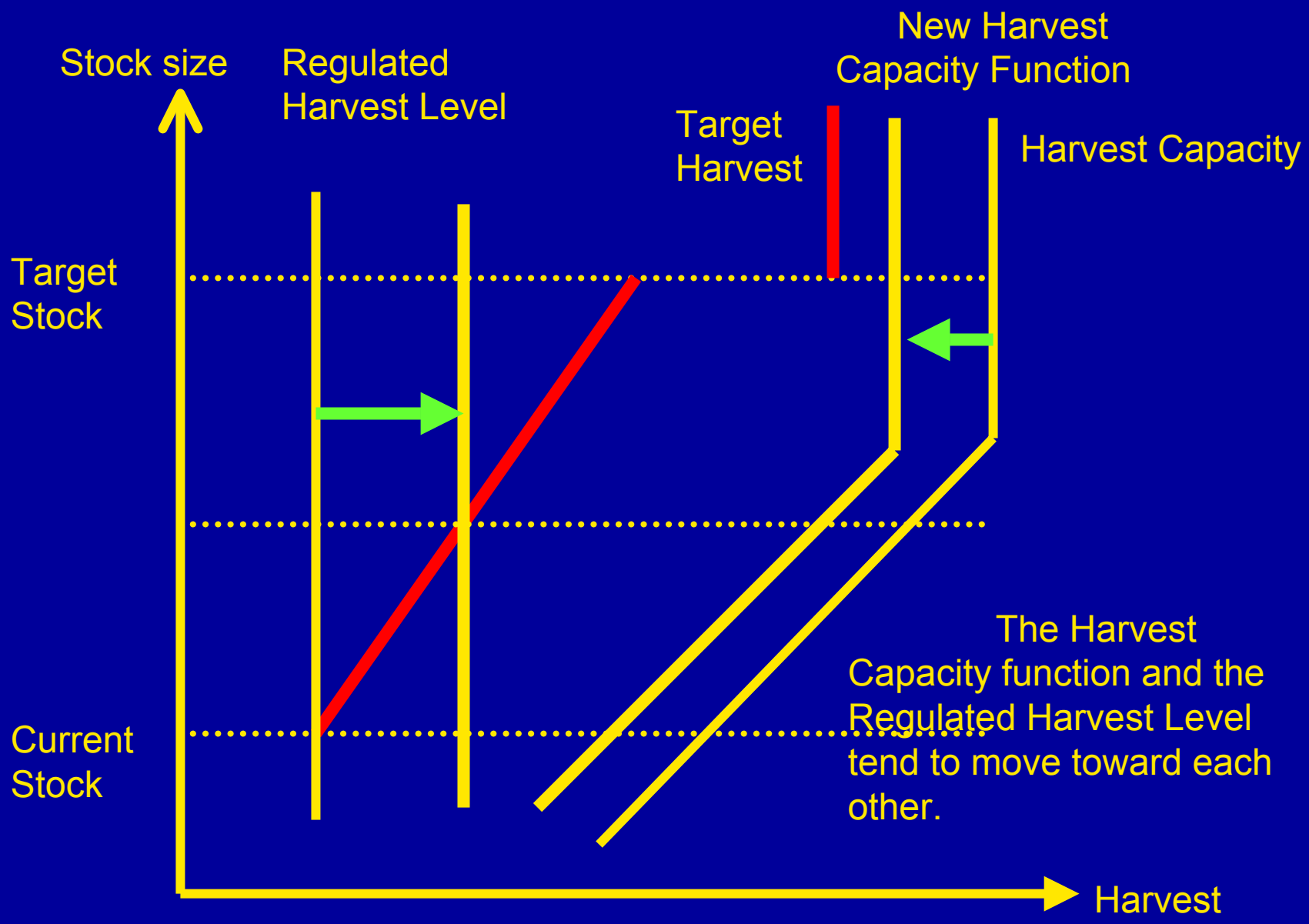
What will happen to the difference between harvest capacity and regulated harvest level through time?

What are the effects of the regulation on the efficiency of production?

In any period the management problem is to get regulated harvest level equal to target harvest at the current stock size.

Look at ITQ programs.

First using the graphs.


Stock size
Regulated
Harvest Level
New Harvest
Capacity Function
Target
Harvest
Harvest Capacity
Target
Stock
Current
Stock
The Harvest
Capacity function and the
Regulated Harvest Level
tend to move toward each
other.
Harvest

Operation of ITQ System

Regulated Harvest Level set by TAC

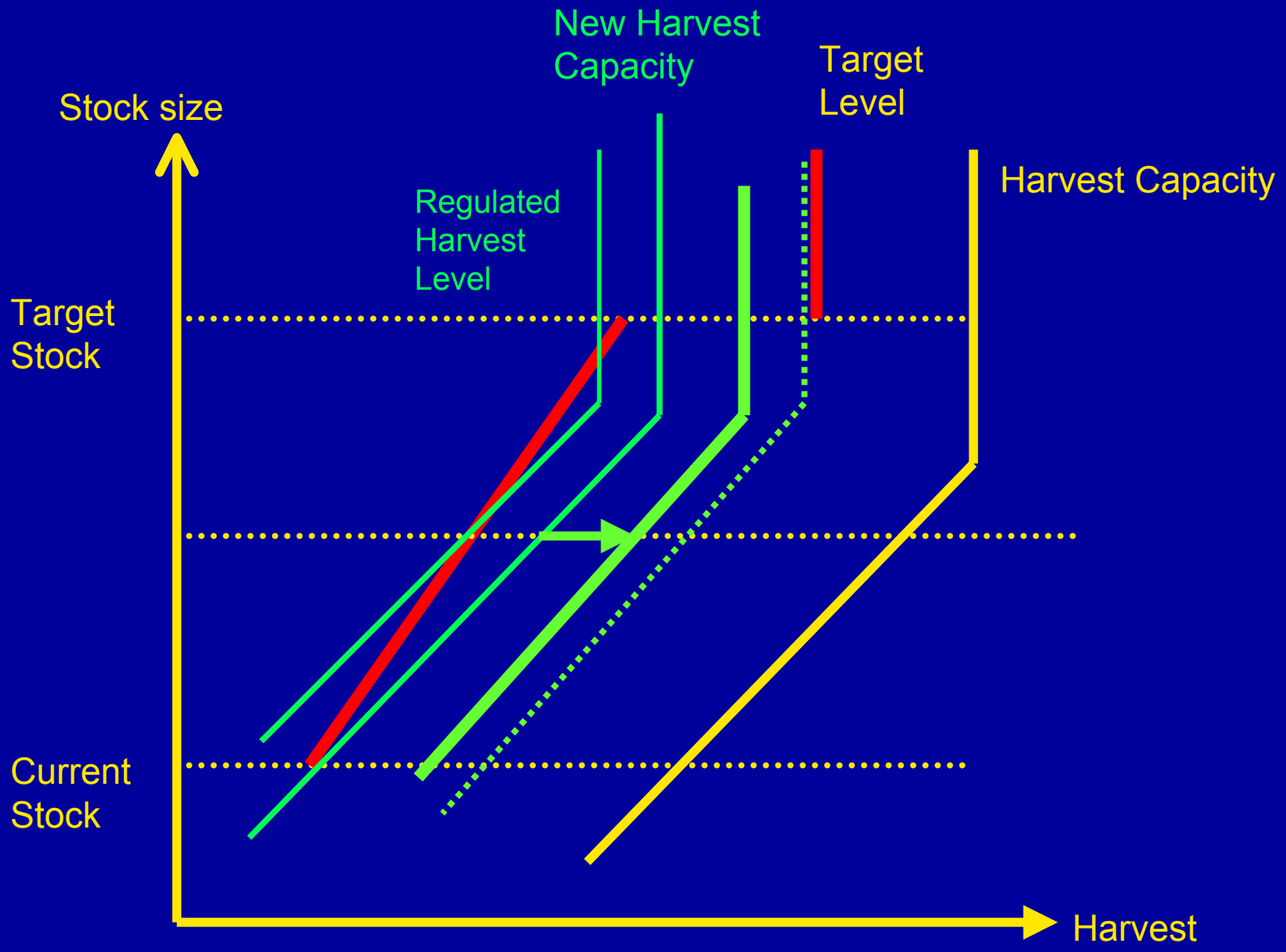
Harvest Capacity will ***tend*** to decrease

Fleet size falls due to quota sales.

Operating procedures change in order to produce TAC at minimum cost.

For comparison, consider the effects of buyback programs.

First using graphs.


New Harvest Capacity
Target Level
Stock size
Harvest Capacity
Regulated Harvest Level
Target Stock
Current Stock
Harvest

Operation of Buyback Program

Regulated harvest level set by new fleet size and any other regulations.

- How does overcapacity vary across relevant stock sizes?
- What other regulations will be necessary?
- How will capacity function change over time in response to regulations and technology change?

How will the two programs compare with respect to efficiency of production?

How will two programs compare with respect to other management objectives?

Summary

In order to properly deal with overcapacity it is necessary to think dynamically in terms of:

- o Target Harvest
- o Harvest Capacity
- o Regulated Harvest Level

It is important to realize that different regulation programs, over time, will result in different amounts of overcapacity.

While focusing on the long term issues of overcapacity, it is important to remember the short run issues.

1. Can regulated harvest levels be kept equal to target harvests on a dynamic basis?
2. What will regulations do to the harvest capacity and hence the amount of overcapacity?
3. What are the implications of the regulatory program on efficiency and other management objectives?